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Journal of Monetary Economics 53 (2006) 507–535
Journal of MONETARY ECONOMICS
www.elsevier.com/locate/jme

# Adaptive learning, forecast-based instrument rules and monetary policy ☆

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Received 21 January 2005; accepted 25 January 2005

**Abstract**

This paper argues that recently popular forecast-based instrument rules for monetary policy may fail to stabilize economic fluctuations. In a New Keynesian model of output gap and inflation determination in which private agents face multi-period decision problems, but have non-rational expectations and learn over time, if the monetary authority adopts a forecast-based instrument rule and responds to observed private forecasts then this class of policies frequently induce divergent learning dynamics. A central bank that correctly understands private behavior can mitigate such instability by responding to the determinants of private forecasts. This suggests gathering information on the determinants of expectations to be useful.


*JEL classification:* E52; D83; D84

*Keywords:* Monetary policy; Forecasts; Instrument rules; Adaptive learning

## 1. Introduction

The recent monetary policy rules literature argues that private-sector forecasts are an important part of central bank decision procedures for the determination of the nominal

☆ The author thanks Jonathan Kearns, Jonathan Parker, Chris Sims, Stephen Williamson, Mike Woodford and an anonymous referee for helpful discussions and comments. This paper formed the third chapter of the author's dissertation at Princeton University. The usual caveat applies. Financial support from the Fellowship of Woodrow Wilson Scholars and the resources of the Bendheim Center for Finance at Princeton University are gratefully acknowledged.

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doi:10.1016/j.jmoneco.2005.01.008

interest rate. Hall and Mankiw (1994) propose nominal GDP forecast targeting. Batini and Haldane (1999) argue that a simple interest-rate rule that posits the nominal interest rate as depending on private-sector inflation forecasts provides a robust formulation of policy. Such rules are also found in a number of large-scale macroeconomic models used in policy evaluation (see, for instance, the Reserve Bank of New Zealand or Bank of England forecasting models). Clarida et al. (1998, 2000) also provide evidence that reaction functions of a number of central banks find an important role for expectations in the current stance of policy. Giannoni and Woodford (2002a) demonstrate optimal targeting rules invariably imply an instrument setting that depends on expectations. More recently, Levin et al. (2003) provide evidence that appropriately designed forecast-based instrument rules are robust to model uncertainty.

In evaluating the merit of such policy proposals, this literature typically assumes that both the central bank and private agents possess the same model of the economy and have rational expectations. It follows that all economic actors hold identical expectations regarding the evolution of the economic variables of interest and therefore that there is no important distinction between internal central bank forecasts and external private forecasts. To the extent that good monetary policy depends on expectations, it is sufficient for the policy problem to be cast in terms of internal central bank forecasts.

In practice, however, internal central bank forecasts and external private forecasts rarely coincide. As a result, both of these sources of forecasts provide potentially important information for the monetary policy decision process. This is evidenced by the considerable resources that central banks spend on forecasting the near-term evolution of the economy. In addition, external forecasts of various private agents are monitored using an array of surveys on the ground that policy can be improve by having more information about the state of the economy. But if these two sources of information about the near-term evolution of the economy diverge, what then is the appropriate dependency of the central bank's instrument setting on such forecasts. Is it appropriate for monetary policy to depend on private forecasts and if so in exactly what way? Or are there reasons for a central bank to concern itself solely with internal forecasts?

This paper therefore seeks to examine whether policy rules that posit the interest rate to depend on private expectations are desirable as a means to stabilize economic fluctuations when agents and the central bank have differing expectations about the evolution of the macroeconomy. We will be interested to learn what is the appropriate dependency of optimal monetary policy decision procedures on private forecasts. In particular, we shall explore whether desirable policy can be described by an instrument rule that naively responds to observed private expectations, or whether more sophisticated uses of the information embodied in these forecasts is required in internal central bank forecasting procedures for economic stability. In so doing, it can be adjudged whether central banks need only devote resources to the measurement of forecasts themselves or whether greater resources need to be devoted to understanding the underlying determinants of such forecasts. Furthermore, if knowledge of the determinants of private forecasts is desirable, the analysis will shed light on their appropriate use in monetary policy design.

This paper proceeds as follows. Section 2 outlines the analysis of Preston (2005a), which develops a model in which agents face multi-period decision problems as in the